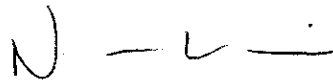




entered in the above-captioned matter on October 25, 2001.

4. The letters attached as Exhibit 1 are true and accurate copies of the letters described above.
5. In the course of my duties, I have also reviewed Tropical Fruit's submission dated November 5, 2004 and attached as Exhibit 2.
6. The November 5, 2004 submission contains the October 2004 spray records and the prospective spray schedule for November 2004.
7. The prospective spray schedule for November 2004 contains reference to hand-spray applications of multiple pesticides in the buffer zone.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. This declaration was executed on the 23<sup>rd</sup> day of November, 2004.



---

Naomi Shapiro  
Assistant Regional Counsel  
Office of Regional Counsel  
Region II  
Environmental Protection Agency

# Exhibit 1

SANCHEZ BETANCES & SIFRE, P.S.C.  
ATTORNEYS AT LAW

(787) 756-7880  
Copier (787) 753-6580  
www.sbslaw.com

Suite 500, Bolivia 33  
San Juan, P.R. 00919  
P.O. Box 195055  
San Juan, P.R. 00919-5055

November 19, 2001

By UPS  
Tracking number  
1Z F26 F85 22 1000 138 9

Eric Schaaf, Esq  
Deputy Regional Counsel  
EPA-Region II  
PO Box 7611  
Washington DC 20044-7611

Re: United States v. Tropical Fruit  
O/F: 910.443

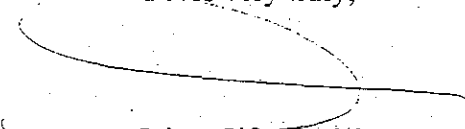
Dear Mr. Schaaf:

Enclosed please find copy of the following documents, in compliance with the Consent Decree:

1. Work plan submitted by Tropical Fruit.
2. Communication from Mr. Eugenio Toro to Mr. Lubin of August 15, 2001 in relation to the planting of Neem trees.
3. Photograph of Neem trees nursery.
4. Evidence of purchase of the anemometer.

I will appreciate your comments as soon as possible.

Yours very truly,



Jaime Sifre Rodríguez

c: Henry Friedman, Esq.  
Enclosures  
910.443/cartas/schaaf/02ct-es

**TROPICALFRUIT S.P.**  
PUERTO RICO  
GROWERS, PACKERS, WORLD WIDE MARKETING

## WORK PLAN

1. We order the anemometer according to the specifications given by E.P.A. When it arrives we will install it (See copy of invoice)
2. Neem trees:
  - a. We constructed a shade to grow the neem trees in (See pictures)
  - b. On October 15, 2001 we received 800 seeds and we seeded them.
  - c. On November 11, 2001 we will receive 500 seeds more.
  - d. We plan to keep the plants in the shade according to the recommendation of Mr. Eugenio Toro approximately 6 months. They will be ready to transfer to the buffer zone on April 15, 2001 (See copy of the letter).
  - e. Phase 1 Outer Vegetation Barrier: will start planting around April 15.
  - f. Phase 2 Inner Vegetation Barrier: will continue after we will finish phase one, in all the areas that has 30 feet space without pulling out mango trees, those mango trees will be pulled out after the harvest of 2002 season will finish.
3. I had conversation, with the Secretary of Agriculture, regarding the monitor person and we are waiting for his answer.

To: Avshalon Lubin  
President  
Tropical Fruit Co. SE  
Guayanilla, P.R.

From: Eugenio Toro  
Fruit Specialist  
Date: 15 August 01

Subject: Plan to develop a Neem Tree Nursery, 1000 trees to be develop and planted in 2001 and 1000 trees to be planted in 2002.

#### Justification

The Neem tree is native of the Center of Dinersity of Indonesia - Indonesia, Birmania, dry forest of India, Pakistan, Sri Lanka and Malaya. Has been distributed in Tropical Asia, Caribbean, Tortola and other islands, South, Center and North America. Belong to the Meliaceae family, the Mahogany, Cedar, Violet tree, santol and lanzon tree. The scientific name is *Azadirachta indica* or *Melia azaridachta*.

Over 25,00 research work have been conducted from this tree as an insecticide in the medicine, as lumber and as one of the most recommended for forestry and reforestry. In Puerto Rico this tree was practically unknown but from about 5 years ago it has been planted as ornamental barrier or wind breaker.

#### Plan for nursery development-1000 trees

Has ambiented and adapted real well in the south part of the Island. The growth of the neem tree is spectacular, with dripping irrigation can growth almost one foot per month reaching in a year about 12 feet or probably more. Like warm and optimim moisture and thrive well in any kind of soil except poor or bad drainage soil.

#### Plan development- Recommendations

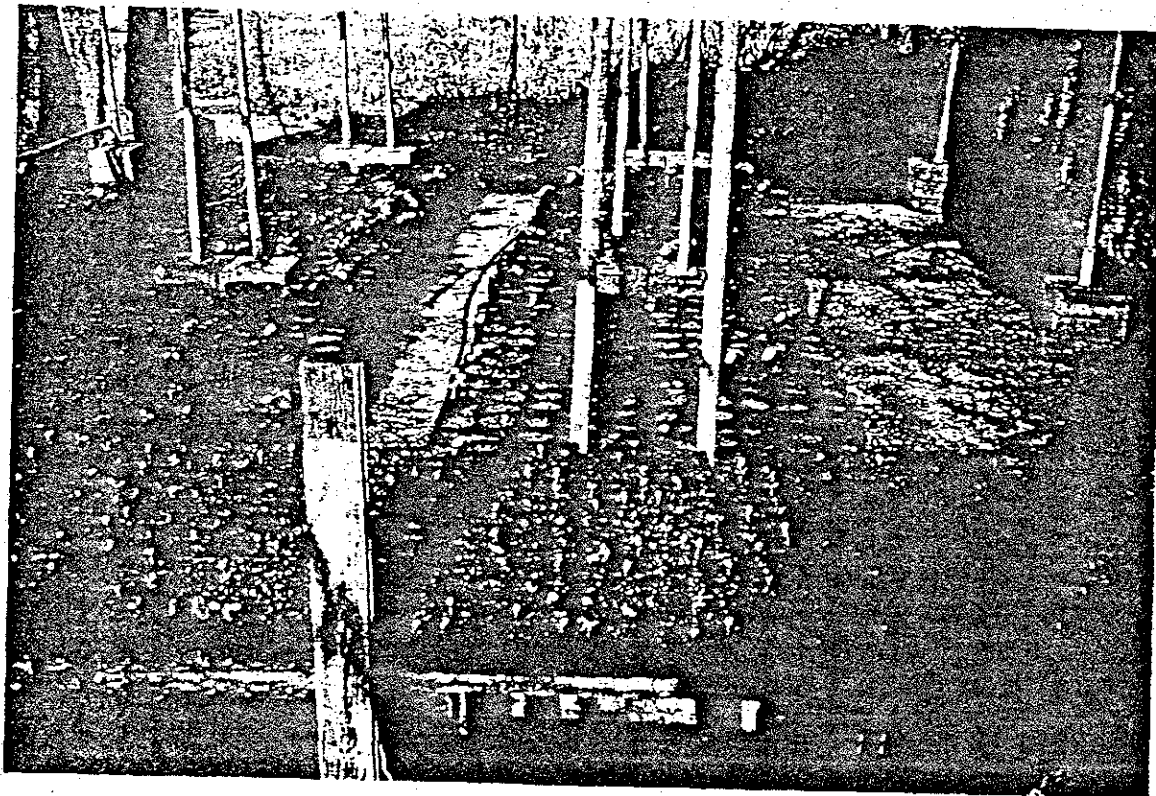
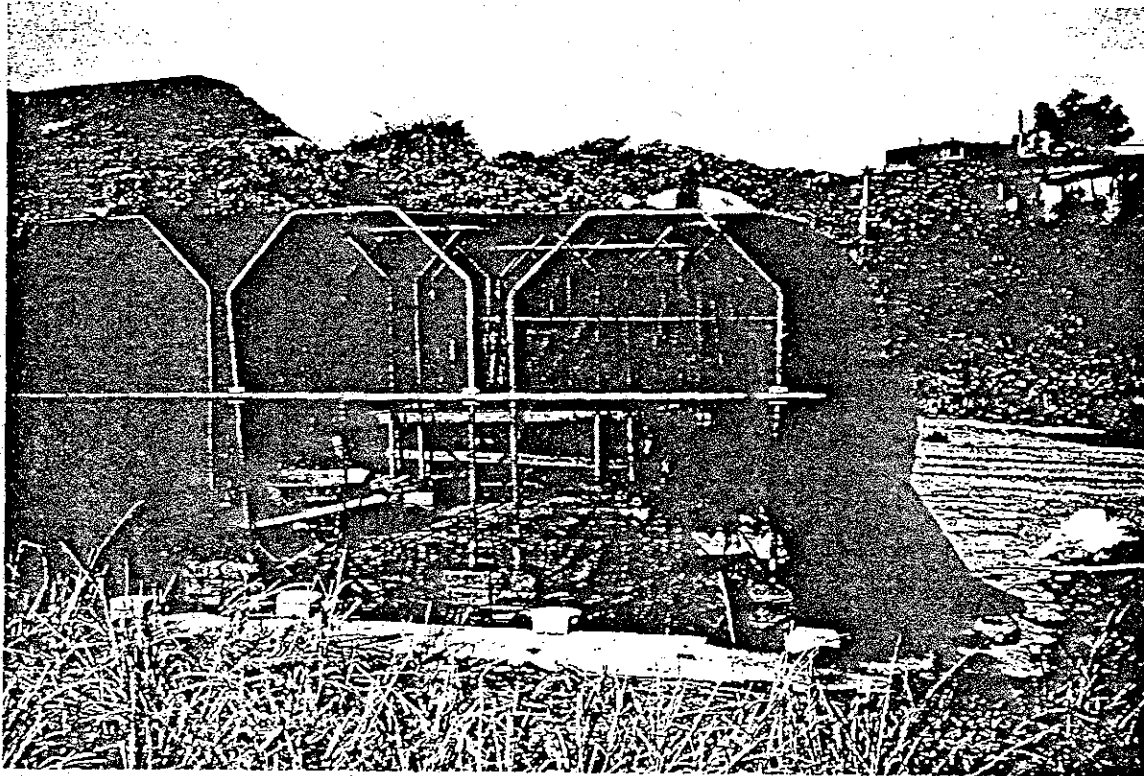
- 1- Establish and structure of Saran ( Sun shade cover) in order to protect the trees.
- 2- Build a germinating bench, plant the seeds in trdes or plant seeds directly in plastic bags.
- 3- Bags has to be placed over gravel coverd with plastic cover, blocks or cement base.
- 4- Saran should be placed 8'-10' high.
- 5- Instalation of a water irrigation system.

Second stage plan

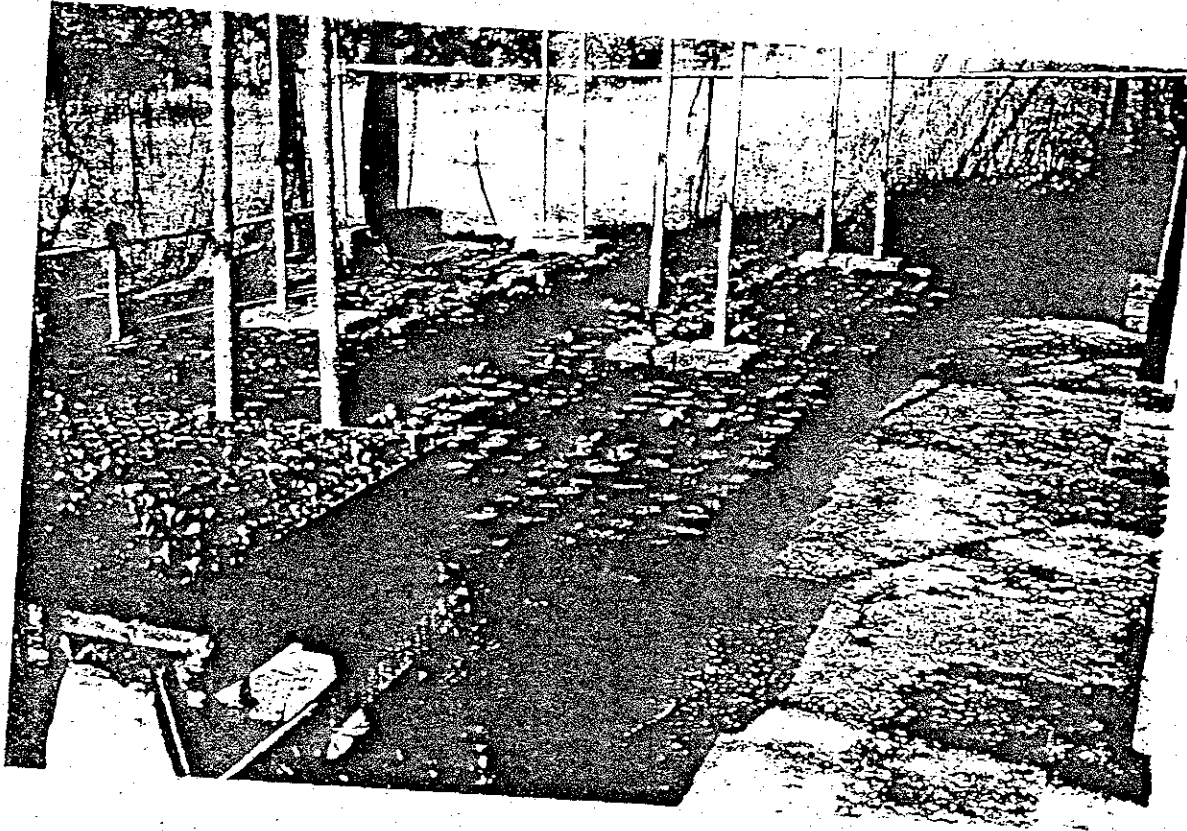
This stage will be produced to establish a second row that is going to be planted 15 feet away from the first row. In 3 years the high of each tree should be over 30 feet high making an outstanding work, an spectacular and perfect impermeable barrier. Any questions, any doubt do not hesitate and let me know.



# Neem trees nursery







faxing for file  
copy

2-20-02

BY FAX AND CERTIFIED MAIL

Jaime Sifre, Esq.  
Sanchez, Betances & Sifre  
Bolivia #33, Suite 500  
Hato Rey, Puerto Rico 00918

Re: U.S. v. Tropical Fruit, et al., Civ. No. 97-1442-DRD

Dear Attorney Sifre:

I am writing with respect to several issues concerning the Consent Decree in U.S. v. Tropical Fruit, S.E. et al. and to follow up on our telephone conversation of January 29, 2002. As you know, the Consent Decree was entered by the Court on October 25, 2001. Several obligations contained in the Consent Decree were due either immediately upon entry or within 30 days of such entry. For example, paragraph 40 of the Consent Decree requires the Settling Defendants (hereinafter, the "Farm") to submit to EPA the name and qualifications of its proposed Project Coordinator and up to two alternates; paragraph 17 of the Consent Decree provides that "[w]ithin 30 days of this Consent Decree, Settling Defendants shall submit to EPA a Work Plan setting forth the manner in which the Farm will implement the buffer zone and vegetative barrier provisions of this Consent Decree." During our telephone conversation on January 29, you indicated that the Farm intended to designate Ilan Oliver as the Project Coordinator and that the Farm had submitted the Work Plan. As the Work Plan had not been received by EPA as of that date, you agreed to send me a copy of the Work Plan. You further agreed that the Farm would submit a formal written designation, as provided in paragraph 40 of the Consent Decree, of Mr. Oliver as Project Coordinator. To date, we have received neither item. Please submit the Work Plan and the formal designation of the Project Coordinator, as agreed and required by the Consent Decree.

Anemometer

With regard to paragraph 29 of the Consent Decree, which requires the Farm to purchase and use a new anemometer, approved by EPA, within 30 days of entry of the Consent Decree, you indicated in our January 29 telephone conversation that the Farm had, in fact, purchased equipment consistent with the specifications set forth in paragraphs 30-31 and Attachment 4 of the Consent Decree, but had not yet installed it. Mr. Oliver discussed the installation of the anemometer with Jaime Lopez of our Caribbean office when Mr. Lopez visited the Farm on January 30; Mr. Oliver indicated that the anemometer would be installed within two weeks of that visit. Please advise us in writing of the installation of the anemometer in accordance with paragraph 29 of the Consent Decree.

Monitor

With regard to the requirement contained in paragraph 39 of the Consent Decree, that the Farm fund, within thirty days of the entry of the Consent Decree, an individual approved by EPA to monitor performance of the hand-spray provisions of the Consent Decree, EPA has approved Professor Rafael Inglés, an entomologist at the University of Puerto Rico, to serve in that capacity. It is, of course, vital that the monitor be in place as soon as possible. Dr. Inglés is available to begin his duties at the farm on March 4, 2002, and, pursuant to paragraph 39 of the Consent Decree, no hand-spraying can take place in the buffer zone without the presence of the monitor. The Farm must ensure that Professor Inglés is notified of a planned hand-spraying event in such a manner that he, or his designated substitutes, can be present during such spraying.

With regard to the further obligation that the Farm fund the activities of the Monitor to the extent of \$10,000 per year, also found in paragraph 39 of the Consent Decree, we understand that it is acceptable to Professor Inglés that he be paid directly in equal monthly installments of \$833.33, beginning on March 4, 2002. Each payment should be sent to Professor Inglés on the first day of each month with a copy to EPA (to the addressees identified in paragraph 55 of the Consent Decree). Professor Inglés can be reached at (787)265-3859 or (787)832-4400, ext. 2449 or the following postal address, P.O. Box 5605, Mayaguez PR 00681.

Notice of Applications

Paragraph 41 of the Consent Decree requires the Farm to provide EPA with notice of all pesticide and fertilizer applications within Section 1 through 8 inclusive and Vega 1,3 and 4 at least 72 hours prior to a planned application using the form provided as Attachment 5 to the Consent Decree. Paragraph 42 requires that, on the first day of each month, the Farm is to submit to EPA written progress reports using the form provided as Attachment 6 to the Consent Decree. To date, the Farm has not complied with either of these requirements. The Farm has not provided EPA with any advance notice of applications using the form at Attachment 5, and the Farm continues to use the old and less complete form, rather than the form at Attachment 6, for its monthly progress reports. Moreover, the progress reports are being submitted to EPA considerably later than on the first day of each month as required by the Consent Decree. For example, the cover letter accompanying the December 2001 spray records was dated January 14, 2002.

We note that the December progress reports indicate that an unknown substance, identified as "Triton," was applied in Sectors 7-8 on December 11, 2001 and that Tilt, a pesticide not currently approved for use on bananas, was applied in the Vega sectors on December 20 and 21, 2001. We remind you that only substances included in Attachment 3 to the Consent Decree may be applied in those sectors. Applications of pesticides not included in Attachment 3 constitute violations of the Consent Decree, and may be violations of FIFRA as well. We advise you to refrain from using any unapproved pesticide in future and to provide the Caribbean office immediately with a label for the substance identified as "Triton."

As you know, the Consent Decree was the result of long and often difficult negotiations between the government and the Farm. The settlement is designed to allow the Farm to continue its

operations, while at the same time protecting the local community and Farm workers from health effects associated with pesticide exposure. The Farm must immediately come into full compliance with all requirements the Consent Decree, including but not limited to the provisions outlined in this letter with respect to the Work Plan, project coordinator, anemometer, monitor, notices of applications, and applications of pesticides, in order to ensure the continued protection of the community and to avoid the imposition of stipulated penalties which can be assessed by the United States for violations of the Consent Decree.

Should you have any questions or comments on the above, please feel free to contact Naomi Shapiro, of my staff, at 212-637-3221. If the Farm requires technical assistance in complying with the Consent Decree, please advise them to contact Lizette Lugo at 787-977-5833 or Jaime Lopez at 787-977-5851; Ms. Lugo and Mr. Lopez can also be reached via facsimile at (787)289-7982 or through electronic mail at [lugo.lizette@epa.gov](mailto:lugo.lizette@epa.gov) or [lopez.jaime@epa.gov](mailto:lopez.jaime@epa.gov). We look forward to working cooperatively with you to ensure that the Farm fully complies with the terms of the Consent Decree.

Sincerely,

Eric Schaaf  
Deputy Regional Counsel

cc: Lizette Lugo  
Jaime Lopez  
Lourdes Rodriguez  
Naomi Shapiro  
Henry Friedman



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866

May 16, 2002

BY FAX and CERTIFIED MAIL, RRR

Lic. Jaime Sifre  
Sanchez Betances & Sifre, P.S.C.  
Suite 500, Bolivia 33  
San Juan, P.R. 00919

Re: U.S. v. Tropical Fruit, S.E., et al  
Civil Action No. 97-1442-DRD

Dear Mr. Sifre:

I write in response to your letters dated April 12, 2002 (received April 17, 2002), March 26, 2002 (received April 12, 2002), March 13, 2002 (received March 18, 2002), February 20, 2002 and November 19, 2001 (received March 18, 2002). As you are well aware, the above-referenced matter has always raised complex issues and required the input of EPA staff in several different offices. The delay in responding in writing to your letters was occasioned by coordinating the input of these various offices.

Monitor

In your April 12<sup>th</sup> and March 26<sup>th</sup> letters, you raise several issues with respect to the monitor approved by EPA for hand-spraying events. In particular, you raised questions concerning the method of approval of the monitor, the system required by the consent decree to communicate a wind change to the applicators in the field, and the propriety of two invoices submitted by Professor Ingles for January and February.

With regard to EPA's naming and approval of Prof. Ingles as the monitor, Paragraph 39 states that "the Monitor will be approved by EPA." Neither party is directed to nor prohibited from nominating a candidate to serve in that regard. EPA would of course have considered any party put forth by Tropical Fruit, but in light of the importance of having a monitor in place, and since several months had elapsed from the date of entry of the CD without any candidate being proposed by Tropical Fruit, EPA sought and approved an appropriate monitor.

At the time of our phone conversation on April 17, 2002, EPA had yet to receive any feedback from Prof. Ingles and I was therefore unable to address your concerns. EPA has now received and reviewed Prof. Ingles' reports on the March hand-spraying events.



Included with the reports are three invoices for Prof. Ingles' services in January, February, and March.

In your letter of April 12<sup>th</sup>, you raise the subject of "the system to advise the tractor of a wind change and some request made by Mr. Ingles which we understand are not part of the Consent Decree." Regarding the anemometer and its associated alarm, Paragraph 31 of the Consent Decree ("CD") specifies:

A sound and light alarm shall be mounted on the tractor pulling the spraying device so as to be audible and visible to the operator, and a sound and light alarm shall be positioned so as to be audible and visible to individuals performing hand spraying, and activated automatically by the anemometer, which shall signal the operator that a wind speed exceedance has occurred and application must cease

Prof. Ingles reports that communication is being made via radio, no automatic alarm system being in place, despite the requirements of Paragraph 31. Prof. Ingles also reports stopping applications on at least three occasions when the wind speed average for a given period fell below acceptable parameters. He further states that as the software to monitor and report ten-minute wind averages has not yet been installed, he has been monitoring the wind speed during applications with a hand-held anemometer. Paragraphs 26 and 29 of the CD require that *all* applications in the relevant sectors of the Farm "shall occur only when 10-minute average wind speeds are between 2-6 mph." It is therefore crucial that an appropriate system be installed immediately.

We also note that the invoices submitted with your March 13, 2002 letter show that Tropical Fruit purchased pager software to alert the applicators in the field of "high/low level alarms and failures," yet no invoices for pagers, a service contract with a phone provider for pagers, or for a visual alarm were submitted; nor is it clear how a pager alone would be audible above the noise of the tractor. To demonstrate full compliance with the terms of the CD governing the anemometer, this additional information should be provided to EPA. Additionally, a certification of the installation and operation of the anemometer, consistent with the specifications listed in Paragraphs 29-31 and Attachment 4 of the CD, should be submitted as well.

Finally, as regards Prof. Ingles' invoices for January and February, his reports indicate that he and his staff engaged in preparatory work associated with assuming the monitor position during those months. Accordingly, the invoices submitted are appropriate. This determination should have no negative impact on the Farm, as EPA considers the three-year term described in Paragraph 39 of the CD to have begun January 2002. Pursuant to Paragraph 39, this term shall continue through December 2004, if necessary.

#### Additional Pesticides

In your letters of February 20, March 13, and April 12, 2002, you request approval for the Farm to use additional pesticides in the sectors of the Farm covered by the CD. We are surprised by the number and frequency of these requests, which far exceeds past requests for stipulations, and question the recitation of urgency for each product. Additionally, as you are already aware, the proximity of residences to the Farm along with the unique geographical and meteorological conditions of the site, make EPA reluctant to approve the use of even an EPA-registered product without considerable and careful review of both the need and the potential risks.

Accordingly, EPA makes the following product-specific response to your requests for approval:

*Bravo 720*: Product review is ongoing.

*Trilogy*: Approval to use this product is granted.

*Abound* (for use on mangos): Product review is ongoing.

*Champion*: As I told you in our phone conversation of April 17, 2002, a product name alone is insufficient to permit identification of the product in question. For example, a search of EPA's pesticide database for products sold under the name "Champion" returned 50 pesticide products, 18 active. No label or EPA registration number was provided for this product with your request for approval nor subsequent to our phone conversation. Without more specific information, EPA staff cannot go forward with your request.

*Spin Tor 2 SC*: No label or EPA registration number was provided for this product with your request for approval nor subsequent to our phone conversation of April 17, 2002. A search by name alone of EPA's pesticide database returned no active pesticide products. Without more specific information, EPA staff cannot go forward with your request.

#### Project Coordinator

Pursuant to Paragraph 40 of the CD, Ilan Oliver and his assistants, Edgar Perez and Jose M. Portalatin, named in your letter of March 13, 2002, are approved as project coordinator and alternates.

#### Work Plan

We have reviewed the work plan submitted as an attachment to your letter of November 19, 2001; it is deficient. A new work plan should be prepared and submitted immediately.

In particular, the work plan submitted makes no time commitments for planting of the inner and outer vegetative barrier nor for the relocation of the mango trees within the no-spray zone. The work plan must include a proper survey of the farm boundaries, a concrete schedule for each planting phase of the inner and outer vegetative barriers, a



replacement protocol for planted neem trees that do not survive transplanting or that do not survive to maturity (as defined by Paragraphs 6 and 7 of the CD), and a maintenance, measuring, and reporting program for the neems. Likewise, an accurate count of the number of mango trees in the no-spray zone and a schedule for their relocation must be submitted, along with a plan for measuring and demonstrating removal of the trees consistent with the appropriate barrier height. An equally detailed plan for the planting of plantains in the no-spray zone should also be included. Pursuant to Paragraph 54 of the CD, the work plan must be signed and certified.

#### Use of Unauthorized Pesticides

Your March 13, 2002 letter stated that an attachment to that letter, allegedly "previously provided to EPA," reflected the pesticides in use at the Farm. The chart attached to your letter was not provided to EPA at any time prior to receipt of your letter and contains unapproved products and methods of application. As you were reminded in EPA's letter of February 22, 2002, signed by Eric Schaaf, the only valid list of approved pesticides is Attachment 3 to the CD, except as amended by a letter dated November 2, 2001, approving the use of Equus 720. Moreover, use of the products in Attachment 3 is limited to the crops specified. Use of any other pesticides or of the listed pesticide on a different crop, without prior written approval by EPA, is a violation of the CD *even if those products are registered for use on the relevant crop.*

Unfortunately, the Farm continues to use products outside the scope of Attachment 3 without EPA approval. I draw your attention again to the use of Tilt in December and of Gramoxone in March; both products were applied to bananas in the Vega sectors despite the lack of EPA approval for such use. Continuation of this practice in disregard of the CD and EPA's repeated admonitions, can only be construed as willful violations of the CD.

#### Forms

Finally, in EPA's February 22<sup>nd</sup> letter to you, the Farm's failure to use Attachments 5 and 6 to report pesticide applications was brought to your attention. The Farm has begun to use the correct forms to report on the previous month's applications (Attachment 6 to the CD), but has thus far not used the product numbering system found on page 2 of Attachment 6. This numbering system should be implemented immediately; the Farm may find the use of this system helpful in restricting its usage only to approved products.

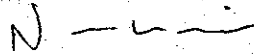
Additionally, despite the reminder in my February 22<sup>nd</sup> letter, the Farm has yet to submit a single notice of application form, found in Attachment 5 of the CD, as required by Paragraph 41. The Farm must begin submitting these forms immediately.

I remind you and your client that the penalties for non-compliance with the Consent Decree are substantial and accrue per day of violation.

I believe this letter covers all the open issues between the parties. Please feel free to contact me by phone (212-637-3221), fax (212-637-3199) or email ([shapiro.naomi@epa.gov](mailto:shapiro.naomi@epa.gov)) at your convenience to discuss these and any other issues. I

look forward to working with you to ensure that the Farm fully complies with the terms of the Consent Decree.

Sincerely,



Naomi Shapiro  
Assistant Regional Counsel

cc: Lizette Lugo, CEPD  
Jaime Lopez, CEPD  
Lourdes Rodriguez, CEPD  
Adrian Enache, DECA-PTSB  
Michael Kramer, DECA-PTSB  
Eric Schaaf, ORC  
Henry Friedman, USDOJ

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San Juan, P.R. 00919  
P.O. Box 195055  
San Juan, P.R. 00919-5055

August 1<sup>st</sup>, 2002

By fax - (212) 637-3199

Attorney Naomi Shapiro  
Assistant Regional Counsel  
U. S. Environmental Protection  
Agency, Region II  
290 Broadway 26<sup>th</sup> Floor  
New York, New York 10007

Re: United States v. Tropical Fruit  
Civil No. 97-1442-DRD  
O/F: 910.443

Dear attorney Shapiro:

First, excuse my delay in answering your letter of May 16, 2002 in relation to the above captioned matter.

Due to personal circumstances, and to the fact that I have been traveling out of the country during the last two months, it was impossible for the undersigned to respond to your letter. The delay has not been due to Tropical Fruit, but on problems related to the undersigned's scheduling.

Monitor:

Paragraph 39 of the Consent Decree provides that "the monitor will be approved by EPA". It is our understanding that said phrase assumes that the monitor will be proposed by Tropical Fruit, and that EPA will either approve or disapprove Tropical Fruit's candidates. EPA, on the other hand, followed a different procedure and appointed Professor Inglés as the monitor. At that time, no reference whatsoever was made to a substitute monitor and that that substitute monitor will be Mr. Kenneth Inglés. I do not see any reference in the Consent Decree to a substitute monitor.

Tropical Fruit did not immediately submit the name of a monitor because at that time it was putting together everything including the new anemometer and the other requisites of the Consent Decree. EPA never called Tropical Fruit to request the name of a proposed monitor. In the normal course of business, EPA calls Tropical Fruit when it needs information or some action from Tropical Fruit's part. In this particular situation, that procedure was never followed.

Nevertheless, as indicated before, Tropical Fruit has no objection to Mr. Rafael Inglés being the monitor. Tropical Fruit does have objection to the substitute monitor Mr. Kenneth Inglés. It is interesting to see that in the June 25, 2002 letter you make reference to an incident in which Mr. Inglés complains that he was abused and intimidated by Mr. Ilan Oliver. I have received the same complaint from Tropical Fruit. Mr. Kenneth Inglés was disrespectful, abusive and intimidating toward Mr. Oliver and Tropical Fruit.

It is not Tropical Fruit's interest to create an issue with the monitor. However, they do emphatically object to Mr. Kenneth Inglés.

Although we understand that there may be scheduling problems, and that there has to be some flexibility, we believe that the proper way to address that situation is for Mr. Inglés to contact Tropical Fruit and try to agree on a reasonable calendar for the different pesticide applications. If a substitute monitor is needed, we must address the procedure and who will be the person or persons who will act as a substitute monitor. That should be a matter of consensus between EPA and Tropical Fruit and not an imposed substitute monitor without even considering Tropical Fruit's comments or recommendations.

I hope we can address this matter through dialog with the intention of reaching a mutual agreeable solution. Please advise.

Method to Advise Wind Change :

As it is a known fact, Tropical Fruit purchased the anemometer system required by EPA. They have made numerous efforts to try to install a system that will allow to connect the extension with the tractor. They have approached Verizon Wireless, Suncom, Celpage and Singular Wireless. None of the above companies have the capability to develop a device by which the station can be connected to the tractor.

There is also another problem in the particular area of concern. There is no coverage by neither of the above mentioned companies in the particular area either for cellular or beeper system.

The method in use by the Farm is the best available.

The manufacturer of the anemometer has indicated to the Farm that there is no software available that can monitor and report 10 minutes wind changes.

If you feel there is any other solution or understand that technology is available, please advise. If EPA confirms what we are saying, then paragraphs 26 and 29 of the Consent Decree must be amended since the Farm installed the system ordered by EPA and the system does not have the capacity to comply with paragraphs 26 and 29 of the Consent Decree.

Inglés Invoices for January and February:

EPA was specific in a letter saying payment of the monitor is to start on March 2002. The Farm has complied with EPA's instructions.

Additional Pesticides :

The Farm is trying to get the most advanced and efficient system. The Farm is also concerned with how future developments in biological products-non toxic will be permitted. Would EPA say that the Farm is asking for too much approval?

Efficiency should not be affected by how many times request for approvals are submitted to EPA.

The Farm is also very concerned with the time that EPA is taking to either approve or disapprove the use of a particular pesticide registered for mango use. For example, the Bravo 720 approval was requested months ago, and in your letter of May 16 you still indicate that the product review is ongoing. When can the Farm expect approval for the Bravo 720?

The same thing happened with the Abound. Product review is still ongoing. When will the Farm receive approval for the Abound? In relation to Champion and Spin Tor 2 SC, enclosed please find copy of their labels. I was under the impressions that those labels were previously sent to you.

If you need any further information, please contact the undersigned.

Tropical Fruit will greatly appreciate if the additional pesticide approval procedure is expedited.

Work Plan :

The Consent Decree did not establish a specific timetable for planting of the inner and outer vegetative barrier, nor for relocation within the no-spray zone. The Consent Decree says that the time frame should not exceed three years.

The Farm has provided us with the additional information pertaining to the work plan:

Neem Trees:

- A. By the end of August, a crew of workers will clean the area where the Farm is considering planting the neem trees. That procedure will include also, the counting of all missing trees at the area which have already been planted and the checking of all the irrigation system to irrigate the neem trees in the area.

- B. The Farm will be ready to transfer the neem trees to the buffer zone on or about September 30, 2002.
- C. The Farm will first complete the outer vegetation area and replace the entire trees that are in poor developing condition.
- D. Next, the Farm will address the inner vegetation barrier in the areas that have 30 feet space without pulling out the mango trees. Those mango trees will be pulled out after the Farm finishes the harvesting season in 2002. Then the Farm will complete planting the outer and the inner vegetation area.
- E. When this work is finished, the Farm will assign workers to maintain all the neem trees until they reach a stage in which it is no longer necessary to take care of them.
- F. The Consent Decree specifies the areas concerned in the planting of the outer and inner vegetation buffer barrier.
- G. When all trees planted reach 20 to 30 feet high, the Farm will ask EPA to check and to approve the next step to create the no spray buffer zone.

Use of Unauthorized Pesticides :

Apparently there is a confusion with the list of the authorized pesticides. In November 2, 2001, a list with the pesticides being used by the Farm was submitted, but that list is not the same as the one attached to the Consent Decree.

In view of the above and in order to avoid any further misunderstanding, a new list agreeable to EPA and Tropical Fruit should be prepared. That list then should be amended from time to time depending on other pesticides approval. If in agreement, please advise so we can inform the Farm and coordinate the efforts to develop the updated pesticide list.

Forms :

We have been informed that that has been corrected and that the Farm is fully complying with this request.

I hope that the above answers your letters of May 16, 2002, and June 25, 2002. Again, please excuse my delay in responding.

Yours very truly,

Jaime Sifre Rodríguez

cc. Mr. Avshalom Lubin

Enclosures

910.443/casax/miscel/105shap



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866

December 9, 2002

CERTIFIED MAIL, RRR

Lic. Jaime Sifre

Sanchez, Betances & Sifre, P.S.C.

Suite 500, Bolivia 33

San Juan, PR 00919

Re: U.S. v. Tropical Fruit, S.E., et al  
Civil Action No. 97-1442-DRD

Dear Mr. Sifre:

I write regarding the use of additional pesticides requested in your letters of February 20, March 13, and April 12, 2002. All of the requested pesticides have been approved for use in accordance with the product labels and local registration requirements. The pesticides and their EPA registration numbers are:

Bravo 720 - EPA Reg. No. 50532-188

This product is approved for use on mango trees. This product is not intended for use where the water table is shallow. Should information become available concerning the vulnerability of surface and/or ground water within the farm to this pesticide, we reserve the right to withdraw this approval.

Abound - EPA Reg. No. 10182-415

This product is approved for use on banana plants. Due to the product's potential to leach into ground or surface water, we make the same reservation as above.

Champion - EPA Reg. No. 55146-1

This product is approved for use on banana plants.

Equus 720 - EPA Reg. No. 1812-437

This product is approved for use on mango trees. We had previously approved the use of this product on mangoes conditioned on PRDA applying for and receiving a Section 24(c) Special Local Need registration. The registration was granted and the permit number is PR-010002.

Spin-Tor 2SC - EPA Reg. No. 62719-294

This product is approved for use on mango trees.

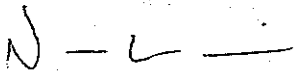


As we discussed previously, the review process is a lengthy one, involving multiple EPA offices. In future, you may expect such review to take approximately 90 days. In accordance with Paragraph 55 of the Consent Decree, any future requests should be addressed to the attention of the Chief of the Pesticides and Toxic Substances Branch. A courtesy copy to the attention of Dr. Adrian Enache, Pesticides Team Leader, at the same address and to me would be helpful as well. Please include a copy of the relevant label, with the EPA registration number clearly visible, and a description of where and how the farm would use the product if approved.

Separate correspondence addressing some additional open issues may follow, although I understand that the farm is working directly with the pesticides team in Edison, NJ to address the farm's difficulties in complying with the anemometer and workplan terms of the Consent Decree. We expect these issues will be resolved expeditiously. It is my further understanding that Mr. Oliver has communicated his willingness to work with Kenneth Ingles as an alternate monitor to both Dr. Enache and to Ken Stoller, Chief of the Pesticides and Toxic Substances Branch. Accordingly, I will advise Professor Ingles that Kenneth may resume his duties beginning January 1, 2003.

As usual, please feel free to contact me by phone (212-637-3221) or email ([shapiro.naomi@epa.gov](mailto:shapiro.naomi@epa.gov)) with any additional comments or concerns regarding this letter or any other aspect of the above-referenced matter.

Very truly yours,



Naomi P. Shapiro  
Assistant Regional Counsel

cc: Adrian Enache, PTSB  
Ken Stoller, PTSB  
Lizette Lugo, CEPD  
Lourdes Rodriguez, CEPD-ORC  
Eric Schaaf, ORC  
Henry Friedman, DOJ



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866

February 26, 2003

**BY FAX 787-756-7880 and  
CERTIFIED MAIL, RRR**

Lic. Jaime Sifre  
Sanchez, Betances & Sifre, P.S.C.  
Suite 500, Bolivia 33  
San Juan, PR 00919

Re: U.S. v. Tropical Fruit, S.E., et al  
Civil Action No. 97-1442-DRD

Dear Mr. Sifre:

I write in response to your letter of January 30, 2003 requesting EPA approval for the use of an additional pesticide, MERTECT 340-F, at the Tropical Fruit farm and inquiring as to the status of the review of the pesticides Abound and Champion. EPA's review of the products is now complete. Regarding these products, EPA has concluded the following:

Abound - new EPA Reg. No. 100-1098

This product is **approved** for use on mango plants. Please note that the EPA registration number you provided for this product pertained to a previous version of the label which was not authorized for use on mango plants.

This product is not intended for use where the water table is shallow. Should information become available concerning the vulnerability of surface and/or ground water within the farm to this pesticide, we reserve the right to withdraw this approval.

Champion - EPA Reg. No. 55146-1

This product is **not approved** for use on mango plants in Puerto Rico.

MERTECT 340-F - EPA Reg. No. 100-889

This product is **approved** for use on mangoes in the packing house only.

Additionally, we were delighted to receive a report from the farm that the anemometer is recording 10-minute wind speed averages. We are looking forward to confirming this information with the monitor. We hope to hear soon that the workplan and remote communication (with the tractor) issues are also resolved.

As usual, please feel free to contact me by phone (212-637-3221) or email ([shapiro.naomi@epa.gov](mailto:shapiro.naomi@epa.gov)) with any additional comments or concerns regarding this letter or any other aspect of the above-referenced matter.

Very truly yours,



Naomi P. Shapiro  
Assistant Regional Counsel

cc: Adrian Enache, PTSB  
Lizette Lugo, CEPD  
Lourdes Rodriguez, CEPD-ORC  
Eric Schaaf, ORC  
Henry Friedman, DOJ



*Copy for  
Luis Rodriguez  
Naimi Shapiro  
Kurt Miller*

SANCHEZ BETANCES & SIFRE, C.S.P.  
ATTORNEYS AT LAW

Tel. (787) 756-7880  
Telecopier (787) 753-6580  
E-mail: [sbs@sbslaw.com](mailto:sbs@sbslaw.com)

Suite 500, Bolivia 33  
San Juan, P.R. 00919  
P.O. Box 195055  
San Juan, P.R. 00919-5055

June 12, 2003

By fax (212) 637-3115

Eric Schaaf, Esq  
Deputy Regional Counsel  
US Environmental Protection Agency  
Region 2  
290 Broadway 17th Floor  
New York, N Y 10007

Re: United States v. Tropical Fruit  
O/F: 910.443

Dear attorney Schaaf:

Although I wanted to address the subject I will discuss in this letter by telephone, in view of some recent work commitments, it has not been possible to coordinate that telephone conversation.

The purpose of this letter is to present to you certain concerns that we have in relation to the implementation of the buffer zone at section D of the farm as that is provided in the Consent Decree.

In agreement with the Consent Decree, section D has a buffer zone of 173 ft. The Consent Decree also provides for two lines of neem trees that as a matter of fact have been planted in most of the area. The farm intends to comply fully with the planting schedule of the neem trees.

After the neem trees are planted, the farm can then plant plantains in the area in which in accordance with the Consent Decree, on or around 1000 mango trees will need to be removed.

The farm, as you know, has always been concerned with this part of the Consent Decree, and particularly, with the difficulty of removing approximately 1000 mango trees, considering the cost of removal and the survival ratio of mango trees subject to said procedure.

Further, if plantains are planted, they will have to remove and re-do the irrigation system for that particular section. Plantains are irrigated in a different manner than mango trees and that means that the farm will have to install a new piping system. The cost per acre of this procedure is estimated at approximately \$1,500 and the amount of acres involved is approximately 20 acres.

If the farm is subject to winds of 40 miles per hour, the plantains will be completely destroyed, losing therefore the purposes for which they were planted. It will take approximately one year to replant plantains in the buffer zone.

In view of the above, and the potential problems that may be encountered if winds of 40 miles per hour destroy the plantains, the farm wishes to submit to you, a proposal in which we understand your interest and that of the community will be protected, and the farm will also be able to operate in a more efficient manner. The proposal is as follows:

1. Allow the neem trees in the buffer zone to grow to their maximum height and density before destroying the mango trees.
2. Leave the mango trees as they are and establish adequate restrictions on how to apply pesticide to that particular section.
3. Once the neem trees grow to their optimum height and density, make a test to see how the neem trees are working as a buffer zone and if they work adequately, then allow the farm to retain the mango trees and to spray them with a mechanism agreeable to the parties.

Submit this proposal for your evaluation, and for discussion with farm representatives. I will appreciate if once you have had time to review this comments, you call me in order to coordinate a meeting with Mr. Lubin to further discuss this initiative, and any other that may satisfy EPA's concerns and at the same time, allow the more efficient operation.

Please call me at your earliest, since I will like to address this matter as soon as

Yours very truly,

Jaime Sifre Rodriguez

Salom Lubin

11/07ct-es





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866

July 2, 2003

BY FAX 787-753-6580 and  
CERTIFIED MAIL, RRR

Lic. Jaime Sifre  
Sanchez Betances & Sifre, C.S.P.  
Suite 500, Bolivia 33  
P.O. Box 195055  
San Juan, P.R. 00919

Re: U.S. v. Tropical Fruit, S.E., et al  
Civil Action No. 97-1442-DRD\

Dear Lic. Sifre:

I write in response to your letter of June 12, 2003, addressed to Mr. Eric Schaaf of this office. In your letter, you propose that the Consent Decree resolving the above-referenced matter be modified to nullify the requirements of Paragraphs 6, 7, 15 and 16. Those paragraphs require the farm to relocate or remove all plants in the No-Spray zone, described in paragraphs 8-14.

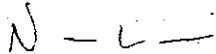
As you may recall, these paragraphs of the Consent Decree were among the most difficult to craft. Extensive negotiations with detailed discussion of the costs, benefits, risks, and growing and meteorological conditions surrounded their creation. Your client, in the person of Mr. Avshalom Lubin, played a key role in these discussions and was keenly aware of the requirements to which he was agreeing. You have provided EPA with no basis to revisit these issues now. The Consent Decree provisions that required the relocation of mango trees were central to the United States' decision to enter into a settlement with Tropical Fruit. Omitting the requirement to relocate the mango trees would deprive the United States of one of its chief aims in agreeing to the Consent Decree.

Accordingly, EPA proposes instead that your client review the consent decree and begin compliance at once with the provisions surrounding the removal of the trees and the preparation and submittal to EPA of a workplan detailing how and when this work will take place. As first brought to your attention by my letter of February 20, 2002, more fully described in my letter of May 16, 2002 and reiterated in my letters of December 9, 2002 and February 26, 2003, the work plan submitted is grossly deficient. Additionally, requests for compliance with the workplan provisions of the Consent Decree have been made directly to Ilan Oliver at the farm by various EPA personnel. A satisfactory workplan will contain at minimum the information outlined below and be submitted no later than July 31, 2003.

The workplan should include time commitments for planting of the inner and outer vegetative barrier and for the relocation of the mango trees and banana plants within the no-spray zone. The work plan must include a proper survey of the farm boundaries, a concrete schedule for each planting phase of the inner and outer vegetative barriers, a replacement protocol for planted neem trees that do not survive transplanting or that do not survive to maturity (as defined by Paragraphs 6 and 7 of the CD), and a maintenance, measuring, and reporting program for the neems. Likewise, an accurate count of the number of mango trees in the no-spray zone and a schedule for their relocation must be submitted, along with a plan for measuring and demonstrating removal of the trees consistent with the appropriate barrier height. An equally detailed plan for the planting of plantains in the no-spray zone should also be included. Pursuant to Paragraph 54 of the CD, the work plan must be signed and certified by a duly-authorized individual.

Should you have any questions or comments on the above, please feel free to contact me at 212-637-3221. If the Farm requires technical assistance in complying with the Consent Decree, please advise them to contact Lizette Lugo at 787-977-5833 or Michael Kramer at 732-321-6610 or through electronic mail at [lugo.lizette@epa.gov](mailto:lugo.lizette@epa.gov) or [kramer.michael@epa.gov](mailto:kramer.michael@epa.gov). As always, everyone at EPA remains committed to working cooperatively with you to ensure that the Farm fully complies with the terms of the Consent Decree in a timely fashion. You are reminded, however, that your client has a little over one year left to comply with the removal and relocation provisions discussed herein and is extremely overdue on the workplan.

Sincerely,



Naomi P. Shapiro  
Assistant Regional Counsel

cc: Lizette Lugo, CEPD  
Michael Kramer, DECA-PTSB  
Jaime Lopez, CEPD  
Lourdes Rodriguez, CEPD-ORC  
Eric Schaaf, ORC  
Henry Friedman, DOJ-ENRD



S A N C H E Z B E T A N C E S & S I F R E , P . S . C .  
A T T O R N E Y S A T L A W

(787) 756-7880  
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Suite 500, Bolivia 33  
San Juan, P.R. 00919  
Apartado Postal 195055  
San Juan, P.R. 00919-5055

February 23, 2004

By fax - (212) 637-3199  
and certified mail

Attorney Naomi Shapiro  
Assistant Regional Counsel  
U. S. Environmental Protection  
Agency, Region II  
290 Broadway 26<sup>th</sup> Floor  
New York, New York 10007

Re: United States v. Tropical Fruit  
Civil No. 97-1442-DRD  
O/F: 910.443

Dear attorney Shapiro:

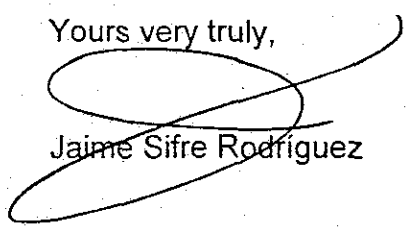
The purpose of this letter is to request EPA to consider the presentation made by Mr. Eugenio Toro in the attached report. This request is predicated in Tropical Farm's interest to obtain the optimum results from the agreed buffer zone, in view of the most recent developments with organic material to address pest control.

The Farm has been diligently working in the buffer zone, and has planted the required Neem trees. As part of that process it has realized that the buffer zone can be enhanced if the mango trees are used as part of it. To address the pests, the farm has requested Mr. Toro to develop a pest control program using organic material. In exhibit A to this letter you will be able to see Mr. Toro's proposal and the benefit it provides in terms of efficiency and cost.


If the proposed amendment to the buffer zone is agreeable, plantains will not be needed as part of the buffer zone, avoiding therefore the need to replant them every year, and avoiding also their destruction in case of a hurricane or strong rains.

Please review Mr. Toro's proposal and contact the undersigned to further discuss this proposed modification.

Yours very truly,

  
Jaime Sifre Rodriguez

Enclosures

To: Avshalom Lubin  
Pres. Tropical Fruit Co.  
Guayanilla, P.R.  
  
From: Eugenio Toro  
Fruit Specialist /AES Ret.

Date: February 12, 2004

Subject: Enhancement of Buffer Zone

## I. Introduction

The mango, **Mangifera indica** is the most important among all the fruits cultivated in Puerto Rico. There are about 2,200 acres planted in the South west area in P.R. By 2001 mango production (selected varieties such as Keitt, Parving, Tommy, Atkins and others) was about 19 millions fruits with a value of around 21 million dollars. Over 80% of the fruits are exported to Europe and U.S. This means that it is one of the most important crop in the local agriculture and the South West part of the Island.

The mango grove in Tropical Fruit Co., is comprised of about 500 acres planted with varieties as previously mentioned marketed internationally and very low quantity in P.R. The grove was planted by 1992. It developed excellent, efficiently and right now is in the optimum production; between 8-10 tons/acre.

Mango trees (leaves, flowers, fruits) are very susceptible to various insects and disease, it is why this crop has to undergo a regular or intensive pest control program. This grove has the advantage that was planted in an open area, and at location where it receives the breeze from the ocean. This does not mean that pest are controlled by this action. But the most noticeable fact is that this farm was a sugar cane farm, and after disappearance of this crop the farm was reforest with mango trees offering the opportunities to 120 employees to work to have a steady job for long. The useful live of well manage mango tree is forty years or more.

## II Buffer Zone Requested by EPA

Because of certain problems and complains of the neighborhood, it has been agreed that a buffer be established to avoid the drifts from the pesticides. The Buffer Zone was selected at the South east and South west of the Yauco river. The buffer zone comprises about 170 feet from the boundaries to the mango grove.

This means that about 1400 trees enter in this buffer zone. The recommendations as far as I know was to move out or relocate the dugged trees into other area or areas. To my concern and evaluation there is no other available or suitable land for the trees because the remaining land is salty, shallow and the water lever high, harmful, and

catastrophic to the mangos. Also to move or relocate the trees is a very hard work task.

To pull out and transplant a tree is very costly. Fruit trees have to be prune completely leaving the trunk and main scaffold to a high of 6' - 7'. Cut have to be protected with and asphalt component and paint the trees with a lime wash to avoid the dry out of the trees.

Also the hole in which the tree is going to be relocated has to be filled with at least 50 gallon of water. When the tree is set, immediately after it has to be water again. The cost of transplant of the size in the buffer zone is costly. Please refer to my expert report produced as part of the litigation before the U. S. District Court for the District of Puerto Rico.

### III Program Alternative

There will be a line of Neem tree : **Azadirachta indica**, planted at the end of the buffer zone. This specie, native from India and belonging to the Melliaceae family was recommended because of its aggressive grow or development. If it is well managed with irrigation system it can grow 1 feet/month and can reach up 90' at adult life and the tap root can penetrate the double of the high if soil structure permit. In 2 or 3 years this tree will surpass 2-3 times the high of the mango trees. The roots are very deep and can support wind of more than 75 mph. Evaluation experience in Martex Farm, Santa Isabel, after Georges hurricane.

It is an spectacular tree, handsome and will help as a pulmonary benefit for the vicinity and improve of the environment. What about the trees in the buffer zone? What is their destiny, any alternative to leave the trees "in situ" manage them organic and biologically? Of course Yes.

I understand that pursuant to the agreement between Tropical Fruit Co. and E.P.A. , this buffer zone can be sprayed by hand to avoid contamination of adjacent areas in this vicinity. As stated before 1,400 trees (around 15 acres) in optimum production comprises the buffer zone and are sentenced to disappear. This means there will be a massacre or mass assassination of those living creatures. If they are pulled out that space left will be subject to a gap where strong winds can go though and cause damages to the trees adjacent and heavy rainfall, floods can cause tremendous erosion effects to the farm, the river and vicinity (neighborhood) of the deposition of many hazards in the area.

One recommendation given was to substitute the trees for plantains. Plantains are very weak plants, very susceptible to rain, wind and last no more than one year. If any heavy rain, a flood occurs, the run off water can drag out the plants causing stoppages to the running water provoking enormous damages to the farm, river and vicinity.

IV General Recommendations

1. Leave the mango trees "in situ" applying an organic and biological care and management treatment.
2. Continue pruning techniques in order to reduce or eliminate insects, diseases, and stimulate new growth but controlling it.
3. Establish an insect and disease control program with organic an biological pesticides registered by E.P.A. an other regulatory agencies.
4. Apply the pesticides program when necessary and no exceeding the label recommendations.
5. Carry out, monitoring and scouting in order to evaluate pest, diseases and infestations.
6. Maintain irrigation systems efficiently.

V Technical recommendations. Beside the actual program of pest control.

## A. Insect control

Mites, aphids, scales, mealybugs, whiteflies, moths, caterpillars, fruit flies, leafhoppers, etc.

PESTICIDE	DOSE	Waiting days for harvesting	OBSERVATIONS
<b>Neemix</b> (botanical insecticide)	½ - 2 gal./acre	0	Apply uniformly in the foliage mainly under leaves when necessary
<b>Azating EC</b> (botanical insecticide)	5-21 oz./acre	0	Same
<b>Pyrellin</b> (botanical insecticide)	1-2 pts./acre	0	Same
<b>Align</b> (botanical insecticide)	5-16 oz./acre	0	same
<b>Biobit</b> (botanical insecticide)	1-4 #/acre	0	Same

<b>Fire ants</b>			
Logic, Award	1-3 teaspoonfull per mound	0	Apply broadcast around the mound

## B. Diseases control anthracnose, scab, mildew

<b>Trilogy</b> (botanical fungicide, insecticide, miticide)			
<b>Trilogy 90 EC</b> (0.5-2%)	30-250 gal water/acre	0	Repeat every 7 days. Do not apply more than 5 gal./acre in solution. Apply before flowering and continue at 20m days intervals.

## C. Weed Control

Round up 1-2%	Mix with 98-99 gallons of water. Do not exceed over 8 quarts / acre
Round up ultra 1-2%	Same

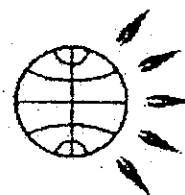
## D. Fertilization

A fertilizer program should be applied as previously programmed or scheduled through the irrigation system or foliage spray. Urea and ammonium sulfate or other elements can be applied by fertigation.

Potassium nitrate can be applied as dual purpose. One as nutrient through the irrigation system and as flowering forcing or induction. This is very important so they can be stimulated to flower as an early or late variety to expand the market season and have an optimum consecutive production yearly and compete favorably in the international market is requested if no objection. So pesticide as Potassium nitrate should be permitted to be sprayed by the blowers because with the program recommended won't contaminate the environment, will be safe and cause no harm to the neighborhood. Also will be quickest, efficient and cost efficient.

Enclosed is a small publication of the Neem tree. Most of the pesticide recommended here are derived from this tree. As a complement for the program I suggest the use of Vapor Guard organic and organic anti-transpirant as sticker or emulsifier mix with any of the pesticide recommended. Vapor guard should be melt with house dish detergent (Vel) which is non ionic dissolving well vapor guard. Mixed with the pesticide the effects last longer in the trees and fruits. Enclosed also a label of this anti-transpirant.

I strongly recommend that this proposal be evaluated as it will serve as a more efficient buffer zone. Further, the mango trees in the buffer zone will be sprayed with organic material avoiding therefore any pesticide risk.



*Spearheading the  
Neem Revolution.*

## The Neem Tree

### An introduction and history

Neem is a medium sized to large tree characterized by its short, straight bole, furrowed, dark brown to gray bark, and dense rounded crown of pinnate leaves. Native to south Asia, Neem is widely planted and naturalized in semi-arid areas throughout Asia and Africa.

[The Neem tree](#)

[Common names in world](#)

[Chemical composition](#)



Neem is an evergreen of the tropics and sub-tropics. It belongs to the family Meliaceae and is becoming increasingly popular for its insect repellant traits and unique property of inhibiting the nitrification process in the soil.

Scientists have now turned their attention to this wonder tree and are studying the chemical composition of extracts from its leaves, seed kernel, bark and other parts. Several Neem -based biological pesticides are available today. Scientists suggest mixing of Neem extracts with prilled urea to increase the efficiency in use of nitrogen in wetlands.

Neem derivatives such as Azadirachtin, nimbidin and a host of other compounds are now used in commercial pesticides. Many bioactive ingredients have been

identified and isolated, the most important ones being azadirachtin and meliantriol.

Neem has been used widely in Indian traditional medicine for various therapeutic purposes for many centuries. Scientific investigations carried out during the last two decades have, in fact, reported anti-bacterial, anti-fungal, anti-viral and anti-fertility properties of Neem with a view to develop neem-based products for human use.

With an extensive and deep root system, the hardy Neem can grow luxuriantly even in marginal and leached soils. Native to India, it thrives upto

**About Neem** ▼

**Introduction**

**Therapeutic uses**

**Environmental use**

**Pest management**

**Fertilizer uses**

**Organic farming**

**Economic potential**

**Indian patents**

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**About foundation**

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**Guestbook**

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**HOME**





an elevation of 1000m. The Neem flowers profusely between February and May. The honey-scented white flowers, found in clusters are a good source of nectar for bees. Neem fruits are green drupes which turn golden yellow on ripening in the month of June, July and August in India.

Neem kernels have about 45% oil. The compounds isolated from the kernels have shown diverse effects including repellent, feeding and oviposition deterrent, growth regulating, sterilant and impairing hatching of eggs. No plant or chemical is known to have such diverse effects on insects. Neem seed cake in purified form is a good protein supplement in livestock feed.

The termite resistant neem timber is used as a building material and in making furniture and farm implements. The bark yields tannin and gum. The amber-hued gum is used as a dye in textiles and traditional medicines. Leaves are used as fodder and green manure.

---

## THE GIFT OF NEEM

The most active, currently identified ingredient of Neem is 'azadirachtin'. It finds applications in Neem-based pesticide formulations which are *safe, natural, biodegradable*, manageable at the farmer's level and environment friendly, unlike chemical and synthetic pesticides which leave behind residues polluting air, water and soil.



This has caused concerns worldwide and there is a widespread demand to replace chemical pesticides with botanical pest control agents. Neem has been identified as the number one alternative which makes it very important for the future.

---

## SOILS AND TOPOGRAPHY

In India, Neem grows in the plains and in areas that reach an elevation of approx. 1850 m. In its introduced range, Neem is cultivated from sea level to a 1500m elevation

Neem is tolerant to most soil types including dry, stony, shallow soils, lateritic crusts, highly leached sands and clays. It is well adapted to soils with pH of 5.0 to 8.5, but grows best on deep, porous well-drained soils with a pH of 6.0 to 6.5. It is moderately tolerant of high alkaline soils with high levels of sodium, carbonates and bicarbonates and has been successfully established on steep, highly eroded sites as well as on degraded soils with calcareous hardpans close to the surface. Neem growth is poor on seasonally waterlogged sites, silty sands, silty alluvial flats, and poorly drained clays as well as dry





sands where the dry season water table is below 8m in depth. On soils deficient in zinc and potassium, growth of Neem trees is poor. The growth of Neem appears to be closely related to soil moisture availability. Growth is best on freely drained sites where the water table fluctuates between an approx. depth of 3 to 5 m throughout the year.

Neem is a useful species for improving soil fertility on degraded dry sites due to the quality of its leaf litter and relatively rapid rate of leaf decomposition. On fallow, loam ferric Acrisols in Togo, topsoil pH and calcium concentrations under 5 year old Neem stands increased at a more rapid rate than those in adjacent stands of *Acacia auriculiformis* A. Cunn. ex Benth. and *Albizia lebbek* (L.) Benth. Increases in soil pH from 5.0 to 7.0 under Neem stands have been observed elsewhere in Africa.

## ASSOCIATED FOREST COVER



In India, Neem is found in a variety of dry evergreen, deciduous and thorn forest types. In northern dry evergreen forests, it is commonly associated with *Albizia amara* Boivin, *A. Lebbek*, *Manilkara hexandra* (Roxb.) Dub., *Sapindus amarginata* Vahl., and *Tamarindus indica* L. In northern desert thorn forests, it grows in association with *Acacia leucophloea* Willd., *A. senegal* Willd., *Balanites aegyptiaca* (L.) Del., *Flacourtia indica* (Burm.f.) Merr., *Holoptelea integrifolia* Planch., and *Propolis cineraria* (L.) Druce. In very dry teak forests, its associates include *Anogeissus latifolia* Wall., *Boswellia serrata* Roxb., *Lannea coromandelica* (Houtt.) Merr., *Sterculia urens* Roxb., and *Tectona grandis* L.f. In southern tropical dry mixed deciduous forests, Neem grows with *Acacia*

*catechu* Willd., *A. latifolia*, *A. leucophloea*, *Bauhinia* spp., *Boswellia serrata* and *Terminalia tomentosa* W & A., as well as in successional forests dominated by *Acacia* spp. and *Anogeissus pendula* Edgew. Neem is also found in the southern tropical thorn forests with *Acacia catechu*, *A. chundra* Willd., *A. ferruginea* DC., *A. latronum* WILLD., *A. leucophloea*, *A. nilotica* (L.) Del. ssp. *indica* (Benth.) Bren., *Albizia amara*, and *Chloroxylon swietenia* DC.

## History of Neem Tree

The history of the Neem tree (*Azadirachta indica* A. Juss.) is inextricably linked to the history of the Indian way of life. Although the antiquity of Neem is shrouded in the mists of time, this evergreen robust-looking tree has long been cherished as a symbol of health in the country of its origin. It has, for a very long time, been a friend and protector of the Indian villager. It is therefore not unusual to find several towns and villages in the Indian countryside named after Neem; for example Neemuch, Neem-ka-Thana, Neemrana, Nemawar and Nimbahera in the northern parts and Limbgoan and Udagir in the western and southern parts of India.

These towns and villages were probably set within dense Neem groves, at one time, on which the villagers depended for shelter, food, fuel and medicines. Trees and forests have remained central to the Indian civilization and Neem has been among the most venerated plant species.

## Neem in Indian lifestyle

To generations of Indians neem was known to provide protection from disease - therefore protecting and planting Neem was not only considered sacred duty - but it was encouraged by religious sanction. *Brihat Samhita*, an ancient Hindu treatise, contains a chapter of verses on plant medicine. It contains recommendations for specific trees to be planted in the vicinity of one's house. Neem was highly recommended. This can also be borne out by the widely held Hindu belief that one who plants three Neem trees lives after death in *Suryalok* (Sun World) for three *Yugas* (epochs) and never goes to hell. ( Dr. Shiva 1993)

The Neem tree is tied in with every aspect of traditional Indian science and culture. Even in ancient Indian astrology, Neem finds a prominent place. It is associated with the constellation '*Uttara Bhadrapada*', whose presiding diety is *Abibudhanya*. In Indian mythology, insects were said to be the creation of *Asuras* (the demons) from whom Neem was said to protect, by weakening their life patterns.



The curative properties of Neem were attributed to the belief that a few drops of heavenly nectar fell on it. The efficacy of Neem as a medicine has been documented in several different ancient treatises like the *Atharva Veda*, the *Ghrhyasutra*, the *Sutrigrantha* and in the *Purana*. In Sanskrit the language of ancient Indian literature, it is referred to as *Nimba*, which is a derivative of the term *Nimbati Swastyamdadati* (To give good health) Randhawa 1993.

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study by FAO points out that some pests may soon be beyond control! Neem seeds contains bio-active fractions that can help in pest management strategies and help us save our environment. This bio-activity of Neem based products has been extensively evaluated and proven. Because of the fear of toxic residues in food products associated with the use of chemical pesticides, there is a growing need for pest control agents of plant origin which do not leave any toxic residues. Though many plant chemicals have been reported to be suitable for this, Neem is the only plant from which the bio-pesticides are commercially manufactured, found effective, eco-friendly and acceptable to the farmers. Neem pesticides are now increasingly used in India on crops like cotton, vegetables, fruit trees, coffee, tea, rice and spices.

## POVERTY:

As our chairman, Dr. Saxena points out "Poverty is not necessarily the want of money or cash in hand. In a wider sense it is the lack of options, whether it is the non-availability of fertilizer for crop cultivation or pesticides for crop protection, medical remedies for family welfare, safe contraceptives for regulating family size, fuel or firewood for cooking, timber for furniture or dwelling, or the availability of appropriate technology for restoring wastelands, or absence of income generation and employment opportunities. In all these respects, Neem could be a 'panacea,' particularly in rural areas."



## POPULATION EXPLOSION:

Today's exploding growth in human population is seriously depleting the world's natural reserves and economic resources. Unless the run-away human population growth rate is slowed down, there would be little hope for raising

everyone out of poverty in the developing world. Besides educational constraints, the non-availability of inexpensive methods of contraception, which do not cause trauma or aesthetic, cultural, and religious sensitivities of people, limit the success of birth regulation programs. However recent findings indicate that some Neem derivatives may serve as affordable and widely available contraceptives.

According to a recent report by the Washington based International Food Policy Research Institute, by 2020, the world will be an even more unfair place than it is at present, with food surpluses in the industrialized world and with chronic instability and food shortages in the south, particularly in the African countries.

By 2050, the scenario may become worse for food importing countries as with even 1 % growth in population levels, countries such as USA may cease to become food exporting countries.

The US academy of sciences currently attaches very high importance to the Neem tree. The United Nations declared Neem as the "Tree of the 21st century". All these developments amply indicate the growing global importance of Neem. Incidentally over 60% of the entire Neem population is in India.

## Bioactivity of the Neem tree

Search for environmentally safe pesticides received an impetus in early 1960s following the publication of 'Silent Spring' by Rachel Carson in 1962. It was around this period that Indian scientists reported the feeding deterrent property of Neem seed kernel suspension against desert locust. Subsequently, several bioactive ingredients were isolated from various parts of the tree, more notable being the isolation of meliantriol and azadirachtin. These findings aroused world-wide interest in the bioactivity of the Neem tree.



The Neem seems to be a virtual designer tree - one that could very well be the brainchild of a genetic engineer - tailor-made for combating the serious problems confronting mankind today. The information being generated on it in the modern format of science continues to confirm all the ancient claims. Its mammalian safety and environment friendliness reports are highly encouraging. Its bioactivity spectrum against the harmful organisms is ever increasing.

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